CLAIMS:

1. A propylene-containing composition, comprising:
   (a) at least 95 volume percent propylene;
   (b) at least 0.5 volume percent propane;
   (c) at least 10 vppm ethane;
   (d) at least 1 vppm ethylene; and
   (e) from 0.5 to 2 vppm dimethyl ether.

2. The composition of claim 1, wherein the composition further comprises:
   (f) at least 0.05 vppm acetylene.

3. The composition of claim 2, wherein the composition further comprises:
   (g) from 1 to 2 vppm acetylene.

4. The composition of claim 3, wherein the composition further comprises:
   (h) from 1 to 3 vppm methyl acetylene.

5. The composition of claim 4, wherein the composition further comprises:
   (i) from 1 to 3 vppm propadiene.

6. The composition of claim 5, wherein the composition further comprises:
   (j) from 5 to 15 vppm C4+ hydrocarbons.

7. The composition of claim 6, wherein the composition further comprises:
   (k) from 0.5 to 1 vppm methanol.

8. The composition of claim 7, wherein the composition further comprises:
   (l) from 1 to 5 vppm water.

9. The composition of claim 8, wherein the composition further comprises:
   (m) from 5 to 20 vppm hydrogen.

10. The composition of claim 1, wherein the composition further comprises:
(f) at least 0.01 vppm methyl acetylene.

11. The composition of claim 1, wherein the composition further comprises:
(f) at least 0.01 vppm propadiene.

12. The composition of claim 1, wherein the composition further comprises:
(f) at least 0.02 vppm C4+ hydrocarbons.

13. The composition of claim 1, wherein the composition further comprises:
(f) at least 0.01 vppm methanol.

14. The composition of claim 1, wherein the composition further comprises:
(f) at least 0.01 vppm water.

15. The composition of claim 1, wherein the composition further comprises:
(f) at least 0.01 vppm hydrogen.

16. The composition of claim 1, wherein the composition comprises from 2 to about 5 volume percent propane.

17. The composition of claim 1, wherein the composition comprises from 300 to 1000 vppm ethane.

18. The composition of claim 1, wherein the composition comprises from 5 to 15 vppm ethylene.

19. The composition of claim 1, wherein the composition comprises from 1 to 3 vppm methyl acetylene.

20. The composition of claim 1, wherein the composition comprises from 1 to 3 vppm propadiene.

21. The composition of claim 1, wherein the composition comprises from 5 to 15 vppm C4+ hydrocarbons.

22. The composition of claim 1, wherein the composition comprises from 0.5 to 2 vppm methanol.

23. The composition of claim 1, wherein the composition comprises from 1 to 5 vppm water.

24. The composition of claim 1, wherein the composition comprises from 5 to 20 vppm hydrogen.

25. The composition of claim 1, wherein the composition comprises from 0.5 to 1 vppm dimethyl ether.

26. The composition of claim 1, wherein the composition comprises from 1 to 2 vppm dimethyl ether.

27. The composition of claim 1, wherein the composition comprises less than 0.01 vppm arsine.

28. The composition of claim 1, wherein the composition comprises less than 0.01 vppm phosphine.

29. The composition of claim 1, wherein the composition is suitable for polymerization.

30. A propylene-containing composition, comprising:

(a) at least 95 volume percent propylene;

(b) from 0.5 to about 5 volume percent propane;

(c) at least 0.02 vppm C4+ hydrocarbons;

(d) at least 0.01 vppm methanol; and

(e) from 0.5 vppm to 2 vppm dimethyl ether.

31. The composition of claim 30, wherein the composition comprises from 2.0 to about 5.0 volume percent propane.

32. The composition of claim 30, wherein the composition comprises from 5 to 15 vppm C4+ hydrocarbons.

33. The composition of claim 30, wherein the composition comprises from 0.5 to 1 vppm dimethyl ether.

34. The composition of claim 30, wherein the composition comprises from 1 to 2 vppm dimethyl ether.

35. The composition of claim 30, wherein the composition comprises less than 0.01 vppm arsine.

36. The composition of claim 30, wherein the composition comprises less than 0.01 vppm phosphine.

37. The composition of claim 30, wherein the composition is suitable for polymerization.

38. A propylene-containing composition, comprising:

(a) at least 95 volume percent propylene;

(b) from 0.5 to about 5 volume percent propane;

(c) at least 10 vppm ethane;

(d) at least 0.05 vppm acetylene; and

(e) from 0.5 to 2 vppm dimethyl ether.

39. The composition of claim 38, wherein the composition comprises from 2.0 to about 5 volume percent propane.

40. The composition of claim 38, wherein the composition comprises from 300 to 1000 vppm ethane.

41. The composition of claim 38, wherein the composition comprises from 1 to 2 vppm acetylene.

42. The composition of claim 38, wherein the composition comprises from 0.5 to 1 vppm dimethyl ether.

43. The composition of claim 38, wherein the composition comprises from 1 to 2 vppm dimethyl ether.

44. The composition of claim 38, wherein the composition comprises less than 0.01 vppm arsine.

45. The composition of claim 38, wherein the composition comprises less than 0.01 vppm phosphine.

46. The composition of claim 38, wherein the composition is suitable for polymerization.

47. A propylene-containing composition, comprising:
    (a) at least 95 volume percent propylene;
    (b) from 0.5 to about 5 volume percent propane;
    (c) at least 10 vppm ethane;
    (d) at least 0.02 vppm C4+ hydrocarbons; and
    (e) from 0.5 to 2 vppm dimethyl ether.

48. The composition of claim 47, wherein the composition comprises from 2.0 to about 5 volume percent propane.

49. The composition of claim 47, wherein the composition comprises from 300 to 1000 vppm ethane.

50. The composition of claim 47, wherein the composition comprises from 5 to 15 vppm C4+ hydrocarbons.

51. The composition of claim 47, wherein the composition comprises from 0.5 to 1 vppm dimethyl ether.

52. The composition of claim 47, wherein the composition comprises from 1 to 2 vppm dimethyl ether.

53. The composition of claim 47, wherein the composition comprises less than 0.01 vppm arsine.

54. The composition of claim 47, wherein the composition comprises less than 0.01 vppm phosphine.

55. The composition of claim 47, wherein the composition is suitable for polymerization.

56. A propylene-containing composition, comprising:
    (a) at least 95 volume percent propylene;
    (b) from 0.5 to about 5 volume percent propane;
    (c) at least 0.01 vppm water;
    (d) at least 0.01 vppm methanol; and
    (e) from 0.5 to 2 vppm dimethyl ether.

57. The composition of claim 56, wherein the composition comprises from 2.0 to about 5 volume percent propane.

58. The composition of claim 56, wherein the composition comprises from 1 to 5 vppm water.

59. The composition of claim 56, wherein the composition comprises from 0.5 to 1 wppm methanol.

60. The composition of claim 56, wherein the composition comprises from 0.5 to 1 vppm dimethyl ether.

61. The composition of claim 56, wherein the composition comprises from 1 to 2 vppm dimethyl ether.

62. The composition of claim 56, wherein the composition comprises less than 0.01 vppm arsine.

63. The composition of claim 56, wherein the composition comprises less than 0.01 vppm phosphine.

64. The composition of claim 56, wherein the composition is suitable for polymerization.

65. A propylene-containing composition, wherein the composition is formed by a process comprising the steps of:

(a) contacting an oxygenate with a molecular sieve catalyst in a reactor under conditions effective to form an effluent stream comprising propylene, propane, ethylene, dimethyl ether and ethane;

(b) separating the effluent stream in a first separation unit into a first fraction and a second fraction, wherein the first fraction contains a majority of the ethane, ethylene and propylene, and wherein the second

fraction contains a majority of the dimethyl ether; and

(c) separating at least a portion of the first fraction into a third fraction and the propylene-containing composition, wherein the third fraction contains a majority of the ethylene and ethane present in the at least a portion of the first fraction, and wherein the propylene-containing composition comprises at least 95 volume percent propylene, at least 0.5 volume percent propane, at least 10 vppm ethane, at least 1 vppm ethylene, and from 0.5 to 2 vppm dimethyl ether.

66. The composition of claim 65, wherein the conditions in step (a) provide for 95 to 97 weight percent conversion of the oxygenate, based on the total weight of the oxygenate fed to the reactor.

67. The composition of claim 65, wherein step (b) occurs at a pressure of at least 150 psig.

68. The composition of claim 67, wherein the pressure is from 150 to 370 psig.

69. The composition of claim 68, wherein the pressure is from 250 to 370 psig.

70. The composition of claim 65, wherein the molecular sieve catalyst comprises a molecular sieve selected from the group consisting of SAPO-5, SAPO-8, SAPO-11, SAPO-16, SAPO-17, SAPO-18, SAPO-20, SAPO-31, SAPO-34, SAPO-35, SAPO-36, SAPO-37, SAPO-40, SAPO-41, SAPO-42, SAPO-44, SAPO-47, SAPO-56, AEI/CHA intergrowths, metal containing forms thereof, intergrown forms thereof, and mixtures thereof.

71. The composition of claim 65, wherein the composition further comprises at least 0.05 vppm acetylene.

72. The composition of claim 71, wherein the composition further comprises from 1 to 2 vppm acetylene.

73. The composition of claim 72, wherein the composition further comprises from 1 to 3 vppm methyl acetylene.

74. The composition of claim 73, wherein the composition further comprises from 1 to 3 vppm propadiene.

75. The composition of claim 74, wherein the composition further comprises from 5 to 15 vppm C4+ hydrocarbons.

76. The composition of claim 75, wherein the composition further comprises from 0.5 to 1 vppm methanol.

77. The composition of claim 76, wherein the composition further comprises from 1 to 5 vppm water.

78. The composition of claim 77, wherein the composition further comprises from 5 to 20 vppm hydrogen.

79. The composition of claim 65, wherein the composition further comprises at least 0.01 vppm methyl acetylene.

80. The composition of claim 65, wherein the composition further comprises at least 0.01 vppm propadiene.

81. The composition of claim 65, wherein the composition further comprises at least 0.02 vppm C4+ hydrocarbons.

82. The composition of claim 65, wherein the composition further comprises at least 0.01 vppm methanol.

83. The composition of claim 65, wherein the composition further comprises at least 0.01 vppm water.

84. The composition of claim 65, wherein the composition further comprises at least 0.01 vppm hydrogen.

85. The composition of claim 65, wherein the composition comprises from 2 to about 5 volume percent propane.

86. The composition of claim 65, wherein the composition comprises from 300 to 1000 vppm ethane.

87. The composition of claim 65, wherein the composition comprises from 5 to 15 vppm ethylene.

88. The composition of claim 65, wherein the composition comprises from 1 to 2 vppm acetylene.

89. The composition of claim 65, wherein the composition comprises from 1 to 3 vppm methyl acetylene.

90. The composition of claim 65, wherein the composition comprises from 1 to 3 vppm propadiene.

91. The composition of claim 65, wherein the composition comprises from 5 to 15 vppm C4+ hydrocarbons.

92. The composition of claim 65, wherein the composition comprises from 0.5 to 1 vppm methanol.

93. The composition of claim 65, wherein the composition comprises from 1 to 5 vppm water.

94. The composition of claim 65, wherein the composition comprises from 5 to 20 vppm hydrogen.

95. The composition of claim 65, wherein the composition comprises from 0.5 to 1 vppm dimethyl ether.

96. The composition of claim 65, wherein the composition comprises from 1 to 2 vppm dimethyl ether.

97. The composition of claim 65, wherein the composition comprises less than 0.01 vppm arsine.

98. The composition of claim 65, wherein the composition comprises less than 0.01 vppm phosphine.

99. The composition of claim 65, wherein the propylene containing composition is suitable for polymerization.

100. A propylene-containing composition, wherein the composition is formed by a process comprising the steps of:

(a) contacting an oxygenate with a molecular sieve catalyst in a reactor under conditions effective to form an effluent stream comprising propylene, propane, ethylene, DME and ethane;

(b) separating the effluent stream in a first separation unit into a first fraction and a second fraction, wherein the first fraction contains a majority of the ethane and ethylene, and wherein the second fraction

contains a majority of the DME, propane and propylene; and

(c) separating at least a portion of the second fraction into the propylene-containing composition and a third fraction wherein the propylene-containing composition comprises at least 95 volume percent propylene, at least 0.5 volume percent propane, at least 10 vppm ethane, at least 1 vppm ethylene, and from 0.5 to 2 vppm DME, and wherein the third fraction contains a majority of the propane and DME present in the second fraction.

101. The composition of claim 100, wherein the conditions in step (a) provide for 95 to 97 weight percent conversion of the oxygenate, based on the total weight of the oxygenate fed to the reactor.

102. The composition of claim 100, wherein the molecular sieve catalyst comprises a molecular sieve selected from the group consisting of SAPO-5, SAPO-8, SAPO-11, SAPO-16, SAPO-17, SAPO-18, SAPO-20, SAPO-31, SAPO-34, SAPO-35, SAPO-36, SAPO-37, SAPO-40, SAPO-41, SAPO-42, SAPO-44, SAPO-47, SAPO-56, AEI/CHA intergrowths, metal containing forms thereof, intergrown forms thereof, and mixtures thereof.

103. The composition of claim 100, wherein the composition further comprises at least 0.05 vppm acetylene.

104. The composition of claim 103, wherein the composition further comprises from 1 to 2 vppm acetylene.

105. The composition of claim 104, wherein the composition further comprises from 1 to 3 vppm methyl acetylene.

106. The composition of claim 105, wherein the composition further comprises from 1 to 3 vppm propadiene.

107. The composition of claim 106, wherein the composition further comprises from 5 to 15 vppm C4+ hydrocarbons.

108. The composition of claim 107, wherein the composition further comprises from 0.5 to 1 vppm methanol.

109. The composition of claim 108, wherein the composition further comprises from 1 to 5 vppm water.

110. The composition of claim 109, wherein the composition further comprises from 5 to 20 vppm hydrogen.

111. The composition of claim 100, wherein the composition further comprises at least 0.01 vppm methyl acetylene.

112. The composition of claim 100, wherein the composition further comprises at least 0.01 vppm propadiene.

113. The composition of claim 100, wherein the composition further comprises at least 0.02 vppm C4+ hydrocarbons.

114. The composition of claim 100, wherein the composition further comprises at least 0.01 vppm methanol.

115. The composition of claim 100, wherein the composition further comprises at least 0.01 vppm water.

116. The composition of claim 100, wherein the composition further comprises at least 0.01 vppm hydrogen.

117. The composition of claim 100, wherein the composition comprises from 2 to about 5 volume percent propane.

118. The composition of claim 100, wherein the composition comprises from 300 to 1000 vppm ethane.

119. The composition of claim 100, wherein the composition comprises from 5 to 15 vppm ethylene.

120. The composition of claim 100, wherein the composition comprises from 1 to 2 vppm acetylene.

121. The composition of claim 100, wherein the composition comprises from 1 to 3 vppm methyl acetylene.

122. The composition of claim 100, wherein the composition comprises from 1 to 3 vppm propadiene.

123. The composition of claim 100, wherein the composition comprises from 5 to 15 vppm C4+ hydrocarbons.

124. The composition of claim 100, wherein the composition comprises from 0.5 to 1 vppm methanol.

125. The composition of claim 100, wherein the composition comprises from 1 to 5 vppm water.

126. The composition of claim 100, wherein the composition comprises from 5 to 20 vppm hydrogen.

127. The composition of claim 100, wherein the composition comprises from 0.5 to 1 vppm DME.

128. The composition of claim 100, wherein the composition comprises from 1 to 2 vppm DME.

129. The composition of claim 100, wherein the composition comprises less than 0.01 vppm arsine.

130. The composition of claim 100, wherein the composition comprises less than 0.01 vppm phosphine.

131. The composition of claim 100, wherein the composition is suitable for polymerization.